# Amesim High-Level Intro

SIEMENS

**Systems Simulation** 

Unrestricted | © Siemens 2021 | YYYY-MM-DD | Siemens Digital Industries Software | Where today meets tomorrow.



An explosion of complexity...



### 

...making the conventional challenges even more difficult to manage

#### **Comprehensive Digital Twin**



# The beating heart

We believe that the comprehensive digital twin is critical to the future of engineering innovation and that simulation and test are the beating heart of the digital twin. By providing you with insight into the real-world performance of your product or process, Simcenter allows you to accelerate innovation over the entire lifecycle.

Jean-Claude Ercolanelli, Senior Vice-President, Siemens



Where engineering meets tomorrow Investment imperatives for a comprehensive digital twin strategy



Page 6 Unrestricted | © Siemens 2021 | YYYY-MM-DD | Siemens Digital Industries Software | Where today meets tomorrow.



#### Simcenter Driving customer benefits



#### **Systems**



Systems modeling and simulation for every phase of development

Extensive library of multi-physics components

Systems sizing and integration

Performance balancing

Simcenter

Controls verification and validation in real-time (HiL)

## Virtually assess and optimize the performance of mechatronic systems

Systems modeling and simulation for **every phase of development** 

Extensive library of **multi-physics** components

Systems sizing and integration

Performance balancing

Simcenter

Controls verification and validation in real-time (HiL)



Virtually assess and optimize the performance of mechatronic systems

Page 10 Unrestricted | © Siemens 2021 | YYYY-MM-DD | Siemens Digital Industries Software | Where today meets tomorrow.

Systems modeling and simulation for every phase of development

Extensive library of multi-physics components

Systems sizing and integration

Performance balancing

Controls verification and validation in real-time (HiL)

Pre (initial)-Design Phase – Defining architecture (high level design) No need for all the data (geometry, physical parameters etc.) you can start building a highlevel and accurate model <u>from day 1 of your product development cycle</u>

#### **Design Phase – Selecting the right components (detailed design)**

As the project matures you can add more physics/data to your model

- From your supplier info/data sheets
- From detailed, fluid and thermal, electromagnetic 2D/3D simulations
- From Tests/measurements performed on (components of) your system.

#### **Operational Phase (Product lifetime)**

Your built model will allow you to **monitor your product performance along its lifetime**: IoT, preventive maintenance, etc.

#### **Next Product Iteration – Improving your product further**

Your model will be used to design the next generation of your product.

Simcenter

Virtually assess and optimize the performance of mechatronic systems

 Page 11
 Unrestricted | © Siemens 2021 | YYYY-MM-DD | Siemens Digital Industries Software | Where today meets tomorrow.

Systems modeling and simulation for every phase of development

Extensive library of **multi-physics** components

Systems sizing and integration

Performance balancing

Controls verification and validation in real-time (HiL)

No need to develop your own libraries...

Available comprehensive libraries include:

- Fluids
- Thermodynamics
- Electrics
- Electromechanical
- Mechanics
- Cooling systems
- Aerospace
- Etc.

#### 45 libraries and 6500 components

#### ...But if you need you can customize/complement the ones we have

- Modify parameters of existing components
- Build your own components
- Import existing components (FMU import)

Simcenter

Virtually assess and optimize the performance of mechatronic systems

Systems modeling and simulation for every phase of development

Extensive library of multi-physics components

Systems sizing and integration

Performance balancing

Controls verification and validation in real-time (HiL)

#### Integrate Your Components/Systems in Bigger Systems;

- How will your product perform in its **real-life environment**
- **Exchange models** with your suppliers/clients
  - Large import/export capabilities
  - Integrate subcomponents in the full model

#### **Compare Systems Architectures/ Designs**

- Easily modify components to
  - Perform <u>what if analysis</u>
  - Improve full system performance
  - Size components to:
    - Avoid over and under designs/costs
    - Insure safe operations of the complete systems

Simcenter

Virtually assess and optimize the performance of mechatronic systems

Systems modeling and simulation for every phase of development

Extensive library of multi-physics components

Systems sizing and integration

Performance balancing

Controls verification and validation in real-time (HiL)

Simcenter

#### **Multipyhysics modeling capabilities**

Allows balancing attributes

- Find the best balance across different attributes:
  - Using advanced post-processing
  - In automotive
    - Balancing performance vs range.
  - Dashboard capabilities

Virtually assess and optimize the performance of mechatronic systems

Systems modeling and simulation for every phase of development

Extensive library of multi-physics components

Systems sizing and integration

Performance balancing

Simcenter

Controls verification and validation in real-time (HiL)

#### **Openness of the platform**

 Interfaces with Simulink or LabVIEW, Python and V Basic Application(excel)

#### **Real-Time simulation capabilities.**

- Export of an **Simcenter Amesim** model to a real-time (RT) environment for use in Hardware-in-the-Loop (HiL) simulation.
- xDT for preventive maintenance, monitoring and decision support, virtual sensors

Virtually assess and optimize the performance of mechatronic systems

Page 15 Unrestricted | © Siemens 2021 | YYYY-MM-DD | Siemens Digital Industries Software | Where today meets tomorrow.



Unrestricted | © Siemens 2021 | 2021-03-18 | Constantin Bonamour | Engagement Manager | Siemens Digital Industries Software | Where today meets tomorrow.

#### Simcenter Webapp Server

Web-based access to simulation results from any device

Cost-effective solution for project engineers

Predefined system model parameterization

Simcenter



Deploy system simulation throughout the company

Page 17 Unrestricted | © Siemens 2021 | YYYY-MM-DD | Siemens Digital Industries Software | Where today meets tomorrow.

Thank You

# francois.iker@siemens.com +32 476 99 15 78

Let's help our customers in creating better products

Page 18 Restricted | © Siemens 2021 | 2022-02-02 | Siemens Digital Industries Software | Where today meets tomorrow.